Office of Energy Efficiency and Renewable Energy

# ADVISOR Paves Road to Faster Vehicle Evaluation and Testing

## Background

In the automotive industry, accurate component and vehicle simulation is critical to efficient development of advanced vehicles, particularly to making intelligent choices about energy management. Simulating vehicle and component performance helps engineers determine how to increase the life of components, improve vehicle performance, optimize vehicle system designs, and reduce development times.

The U.S. Department of Energy (DOE) and the National Renewable Energy Laboratory (NREL) have worked with industry partners to develop a sophisticated systems analysis tool that can answer crucial questions about specific component and vehicle designs. ADVISOR 2.0 is a hybrid electric vehicle (HEV) simulation model written in a widely used software environment: MATLAB/Simulink. This analysis tool tests the effect of changes in vehicle components (such as motors, batteries, catalytic converters, climate control systems, and alternative fuels) or other modifications that might affect fuel economy, performance, or emissions. The user can alter simulation results by selecting vehicle component types, sizes, and parameters.

ADVISOR has been employed successfully by hundreds of users in organizations around the world. The simulation tool can be used for conventional, advanced, light, and heavy vehicles.

## Accomplishments

- Used by the auto industry to develop advanced vehicles and components.
- Recognized as a comprehensive tool that contains actual component and vehicle data from industry. The model is continuously updated with component test data by users and through university validation efforts and is flexible enough to model specific components and vehicle configurations.
- NREL distributes ADVISOR, informs users of its capabilities, and offers users a forum to share ideas, data, and dialog via the internet (http://www.ctts.nrel.gov/analysis/).


*ADVISOR 2.0 tests how changes in vehicle components affect fuel economy, performance, and emissions.*

## Benefits

- Reduces testing time to evaluate various vehicle alternatives.
- Provides a shared simulation tool for government and industry.
- Assists industry in developing fuel-efficient vehicles and components.

## Future Activities

- Continue to validate the model using industry and university data.
- Continue to improve and expand ADVISOR's functionality and component library.
- Work to ensure ease of consumer use.

## Partners in Success

DaimlerChrysler Corporation
Ford Motor Company
General Motors Corporation
National Laboratories
Automotive Suppliers
Universities

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February 1999